

## CITY COUNCIL REPORT

DATE: March 21, 2013

TO: Mayor and Councilmembers

FROM: Ladd Vagen

CC: Kevin Burke, Josh Copley, Jerene Watson, Leadership Team

SUBJECT: Aerial Photography

This is in response to the request from Mayor and Council.

### DISCUSSION

The following list of questions came from the Council meeting on March 19<sup>th</sup>, 2013 – the answers are in italics below:

- 1) (a) Why does Yavapai County's interface allow iPhone and iPad to call up the maps, but the Coconino County GIS does not? (b) Could we make that available on the system the public can access here?
  - a) *Yavapai's Parcel viewer is available for use on mobile devices via a web browser, but it is a desktop version, compatible with mobile devices, not a mobile app. Coconino's Parcel viewer is powered by Silverlight (a Microsoft product) and is incompatible with mobile devices, except possibly a mobile device powered by Windows Mobile Operating System. Although Yavapai's parcel viewer is available on-line, it is an old component of the ESRI software which has been discontinued and is no longer supported.*
  - b) *The City has the same GIS software (ESRI Software) as do Yavapai County, Coconino County, the City of Sedona, and virtually all government entities using GIS. The ESRI software which the City currently owns is the most current version available. Included with the software at no additional cost is the ESRI web development kit. Therefore, from a software perspective, the City currently has the software necessary to develop and maintain a publicly accessible GIS website. Where we are constrained is with budget and personnel. We would need to fund and hire a GIS web developer to develop and maintain the web interface – approximately \$84,000 ongoing in the general fund and purchase and configure a public facing web server along with appropriate network security to host the web system – approximately \$8,000 one-time, but refreshed every 4-5 years. This project would enable the City to have and maintain a public facing GIS website. A separate project would be the development of a true City*

*of Flagstaff mobile GIS app which would require additional development tools.*

- 2) (a) Is Yavapai using Bing and getting updated material annually rather than securing photography themselves? (b) Are they seeing more accuracy due to this?

*a) Yavapai is using ESRI World Imagery which is currently hosted and provided by ESRI. The imagery is a mash-up of different sources 'stitched' and stretched together, some from Landsat (satellite), some from Bing, some from Aerials Express, and some from USGS Digital Ortho Quarter Quad imagery. Updates are unpredictable and intermittent, spatial accuracy is not guaranteed, and spatial resolution is random.*

*b) When the user zooms in as close as the online application allows, the best spatial resolution provided is one foot. Features such as manholes, catch basins, fire hydrants, traffic signals, traffic signal poles, light poles, or utility poles are not reliably distinguishable on a one foot resolution image from ESRI Worldwide Imagery.*

*The Bing mapping service as it exists now, is freely available to licensed users of ArcGIS (which includes the City). However a recent statement from ESRI revealed that this will change soon:*

*"Complimentary use of Microsoft's Bing Maps with ArcGIS will begin to be phased out as of February 28, 2013, and will be phased out completely by September 30, 2013. ArcGIS will continue to be Bing Maps ready, but you will have to obtain your own Bing Maps key directly from Microsoft and input the key into your ArcGIS products. Once you input the new key, you will be able to use Bing Maps in your ArcGIS products"*

*Pricing is not listed on Microsoft's website and for info on licensing and obtaining an Enterprise Key, a representative from Microsoft would need to be directly contacted.*

- 3) (a) Would like you to ask them (Yavapai) if they are seeing more accuracy due to annual updates and (b) whether they also secure photos for internal-only use like we do.

*a) As stated previously, updates to the Bing and ESRI World Imagery services are unpredictable, sporadic, and not guaranteed.*

*b) Yavapai County GIS (YCGIS) commissioned an aerial flight in 2007 which included imagery and LiDAR ((LiDAR = Light Detection and Ranging) - two foot contour topographic data is produced from LiDAR) as related to floodplain mapping within the Verde River Lower Oak Creek, and Aqua Fria watersheds. In 2009 they purchased 1 foot resolution images of the northern half of the County from APS. APS does not have a predictable flying schedule or area of interest, and just happened to be flying during 2009. As far as can be determined, no other APS-sponsored flights have occurred in that area since 2009.*

*The reason we do not see this 2009 Imagery option on the YCGIS website is due to the nature of the purchase agreement. The data APS provided is restricted only to internal use for YCGIS and cannot be served or distributed externally. In addition to the APS data, Yavapai County has no-charge access to imagery acquired by the Sedona, Prescott, and Prescott*

*Valley GIS departments, but again, it is restricted to internal use only. From what we have learned in speaking with GIS personnel from these agencies, imagery and LiDAR acquisition occurred during the following time frames:*

- i) City of Prescott March 2012 by Cooper Aerial*
- ii) City of Sedona Fall 2011 by Cooper Aerial*
- iii) Prescott Valley 2008 by Sanborn*

*All of these projects yielded:*

- i) images with 6 inch spatial resolution, and guaranteed 1 meter spatial accuracy (all features are within 1 meter of the actual location)*
- ii) two foot contour topographic data which satisfies FEMA standards for digital flood insurance rate mapping.*

4) Why do they (Yavapai) have 4 options for map layers and do they contract for the layering?

a) *These 4 layers are served by YCGIS.*

- i) The NAIP, acquired in 2010, refers to the National Agriculture Imagery Program and is administered by the USDA's Farm Service Agency (FSA) through the Aerial Photography Field Office (APFO). Since its primary use is intended for agricultural applications, NAIP is acquired during the summer when plants have their leaves. It has low spatial resolution (1 meter) but is effective and available at no cost to the user. It is used primarily for studies of vast croplands or expansive forest stands.*
- ii) The digital Digital Globe layer is satellite imagery from 2007 purchased by YCGIS and is most likely intended to show change over time in relation to the dates of the other layers. It has a one foot spatial resolution and YCGIS hosts this data locally.*
- iii) Similarly, the Aerials Express layer from 2009 was purchased by YCGIS and has a spatial resolution of one foot, and is also hosted locally.*
- iv) The fourth layer on the YCGIS website is ESRI World Imagery which is currently hosted and provided by ESRI at no charge*

5) Who provides their (Yavapai) digital images, and do they pull them in off a product that is out there for anyone to use (such as Google, Bing)?

a) *Same answer as number 4*

6) If we need to spend \$98k to update the photos, OK, but if we can do that and update our system, too, would like to know about that option, too. Can we use something that is already out there for the imagery and spend the money on an updated system?

a) *The system/software does not need to be updated as it is already the most current version available from ESRI. Our constraints are:*

- i) Personnel – the GIS section is small – currently 2 positions, with a 3<sup>rd</sup> position to hopefully be filled in April to replace a staff member the City lost to the Coconino County. Prior to 2008, the GIS section consisted of 5 staff members. Additionally, the GIS staff does not currently have the expertise to develop and maintain the web interface;*
- ii) Time – the current GIS staff are fully assigned with tasks and projects and, besides not having the necessary expertise, do not have available time for additional projects;*

- iii) *Money – the aerial request is a one-time expense; the funding required to hire a GIS web developer is on-going; the purchase of the necessary server and network infrastructure would reoccur every 4-5 years.*
- 7) (a) Do we coordinate with Coconino County in securing aeriels? (b) Do they need photos and should we be sharing the cost and project with them?
  - a) *The City coordinates with the County whenever possible – there are no IGAs in place that guarantees the County's participation.*
  - b) *The County has updated aerial imagery when someone gives it to them. Sources include:*
    - i) *State-wide aerial imagery (2007)*
    - ii) *Outlying areas (Blue Ridge, Mormon Lake – 2004)*
    - iii) *City of Page (~2010)*
    - iv) *City of Sedona (2011)*
    - v) *City of Flagstaff (2007)**The County has updated specific areas when needed (Bellmont, Doney Park, Elk Park Meadows, Kachina Village – 2009, and the Shultz burn area – 2012). The County has no plans for future flights at this time, and may never have had aerial photos taken of the entire county (Coconino County is 18,618 square miles in size – the second largest county in the United States);*
- 8) We haven't had a Work Session so I would be interested in knowing more about the comparison of Yavapai County to Coconino County GIS program that the public can access.
  - a) *The answer is the same as question 1. Additionally, we will have a short presentation on GIS at the work session/special council meeting scheduled for March 26<sup>th</sup>.*
- 9) Would like to know the County's perspective and if we could switch off paying for this every other update if they shared photo data.
  - a) *The County does seek funding for these types of events now only on an as-needed basis and they are not scheduling reoccurring data acquisitions.*
- 10) Funding Sources:
  - a) **General Fund** – *The Division of Information Technology has budgeted \$75,000.00 in Fiscal Year 2013 for the purchase of aerial imagery in account number 001-0833-502-2006.*
  - b) **Enterprise Fund** – *The Stormwater Section will fund \$17,019.00 from savings related to the drainage maintenance program in Fiscal Year 2013 account number 040-3206-601-2105.*
  - c) **Enterprise Fund** – *The Utilities Division will fund \$2,900.00 from savings related to the ADWR Fees that are not required in Fiscal Year 2013 due to changes in state law in account number 201-4201-700-2811.*
  - d) **Enterprise Fund** – *The Landfill Section has budgeted \$40,000.00 in Fiscal Year 2013 for the purchase of aerial imagery in account number 280-4104-790-4104.*
- 11) Are the aerial photos independent from the system/software?
  - a) *Yes. The photos are JPG files; the system/software provides the delivery method for those photo files.*

## RECOMMENDATION / CONCLUSION

This report is for information only.